TABLE 1.—*Parts per million*

No.	Date	Amount	Precipitation	Nitrates	Nitrites	Free NH_3	Alb. NH_3	SO_4	Cl
1	June 12	0.1	Rain			0.08	0.04		7.15
2	Sept. 19	1.2	do	0.03	.002	.112	.04		7.15
3	Sept. 22	1.9	do	.01	Traces	.08	.056		3.6
4	Sept. 23	.5	do	1.00	.014	.08	.056		3.6
5	Sept. 25	2.25	do	.02	.032	.112	.04		3.6
6	Oct. 4	.2	do	.01	.01	.24	.056		3.6
7	Oct. 6	.25	do	.01	.032	.24	.08		3.6
8	Oct. 7	.3	do	.01	.002	.32	.16		3.6
9	Oct. 10	2.5	do	.01	.002	.32	.04		10.7
10	Oct. 14	.5	do	.01	.024	.16	.08		3.6
11	Oct. 23	1.1	do	.01	.04	.16	.16		3.6
12	Oct. 27	.55	do	Traces	.036	.32	.04		10.7
13	Oct. 31	.3	do	Traces	.04	.112	.112		10.7
14	Nov. 10	.1	do	.02	.036				10.7
15	Nov. 12	1.	do	.036		.04	.08		10.65
16	Nov. 15	1.	do	.04	.5	.056	.28	0.044	3.6
17	Nov. 17	1.25	do	.21		.056	.16		3.6
18	Nov. 20	.5	do	.03	.5	.08	.04		10.65
19	Nov. 23	1.5	do	.036	.25	.056	.04		7.15
20	Nov. 27	.25	do	.036	.5	.08	.056		7.15
21	Dec. 9	4.	Snow	.36	Traces	.2	.136	.428	3.6
22	Dec. 11	.3	Rain	.12	.05	.08	.056	.324	3.6
23	Dec. 14	1.	Snow	.01		.16	.24	.146	10.7
24	Dec. 31	1.15	Rain	.01	.05	.08	.04	.168	7.
25	Jan. 6	.5	do	.01	.025	.24	.136	.134	7.
26	Jan. 13	.25	do	.24	.05	.32	.2	.184	7.
27	Jan. 15	.3	Rain and snow	.1	.05	.112	.056	.068	7.
28	Jan. 16	.25	Rain	.08	.05	.116	.056	1.68	7.
29	Jan. 26	2.	Rain and snow	.12	.5	.16	.2	1.7	7.
30	Feb. 16	.25	Rain	.01	.05	.08	.04		10.7
31	Mar. 2	.6	do	.030	Traces	.056	.112		10.7
32	Mar. 5	.6	Snow	.02	.05	.16	.056		7.15
33	Mar. 19	.4	Rain and snow	.01	.05	.32	.2		10.7
34	Mar. 21	.9	Snow	.01	.05	.16	.056		10.7
35	Mar. 26	.15	Rain	.01		.16	.056		3.6
36	Mar. 31	.08	do	.03	.03				17.5
37	Apr. 7	.08	do	.07	.01	.136	.056		10.7
38	Apr. 16	.35	do	.02	.05	.2	.32	Traces	3.6
39	Apr. 19	.4	do	.02	.05	.056	.112	Traces	7.2
40	Apr. 20	.15	do	.03	.05	.32	.2	Traces	7.15
41	Apr. 24	.4	do	.01	.04	.32	.36	Traces	7.15
42	Apr. 30	.2	do	.01	Traces	.08	.04		10.7
43	May 3	.7	do	.01	Traces	.114	.056		10.7
44	May 7	.7	do	Traces	Traces	.24	.136		15.25
45	May 16	.5	do	.01	Traces	.16	.056		3.6
46	June 3	1.05	do	.01	.03	.112	.2		7.2
47	June 4	.3	do	.01	.01	.32	.04		3.6
48	June 8	.3	do	.01	.05	.2	.136		3.6

TABLE 2.—*Data from table 1 converted to pounds per acre*

[1 inch of rain over 1 acre=226,875 pounds]

No. of sample	Nitrates	Nitrites	Free NH_3	Alb. NH_3	Sulphur	Chlorides
1			0.001815	0.000907		0.162215
2	0.00816	0.00054	.030492	.01089		1.9464
3	.004310		.034485	.024139		1.551825
4	.113437	.001381	.009075	.006352		.408375
5	.010209	.016350	.057172	.020418		2.53768
6	.000453	.000453	.010890	.002541		1.6335
7	.000567	.001814	.013612	.004537		.204184
8	.000680	.000136	.021780	.010890		.245025
9	.005671	.001134	.118499	.022687		6.06890
10	.001343	.002722	.018150	.009075		.408375
11	.002495	.009982	.039920	.039920		.888416
12		.004492	.039920	.004991		1.335159
13		.002722	.007623	.007623		.728268
14	.004530	.000816				.242756
15	.068468		.009075	.018150		2.416218
16	.009075	.133437	.012705	.063525	.01108	.816750
17	.059554		.015881	.045374		1.020934
18	.003403	.056718	.009074	.004537		1.208064
19	.012251	.085078	.019057	.013612		2.433000
20	.020418	.028359	.004537	.003176		.405500
21	.026952		.014973	.010182	.03204	.269524
22	.008167	.003403	.005444	.003811	.02205	.245023
23	.000181		.002904	.004356	.02649	.194205
24	.002609	.013045	.020872	.010436	.04383	1.82364
25	.001134	.002835	.027224	.015427	.01520	.794059
26	.013684	.002850	.018245	.011403	.010491	.399126
27	.006806	.003403	.007622	.038114	.004628	.476434
28	.004537	.002835	.006579	.003176	.095386	.397026
29	.063350	.226875	.072600	.907500	.771375	.247625
30	.000567	.002935	.004537	.002268		.606882
31	.004083		.007623	.015246		1.456537
32	.000226	.000567	.001814	.000635		.081102
33	.000907	.004537	.029040	.018150		.971025
34	.000158	.000794	.002540	.000889		.169986
35	.000340		.005444	.001905		.122511
36	.005445	.005445				.317625
37	.001270	.000181	.002464	.001016		.194205
38	.001588	.003970	.015881	.025409		.286861
39	.001815	.004537	.005082	.010164		.653400
40	.001020	.001701	.010889	.006806		.243321
41	.000907	.003630	.029040	.032670		.648863
42	.000453		.003627	.001814		.485311
43	.001588		.018104	.008893		1.699288
44			.037114	.021589		2.421883
45	.001134		.018149	.006352		.408373
46	.002382	.007146	.026680	.047643		1.714169
47	.000680	.000680	.021780	.002722		.245023
48	.000680	.003403	.013612	.009256		.245023

PLAN FOR DIRECT CALL TO SHIPS BY RADIO FOR WEATHER REPORTS DURING HURRICANE SEASON

[Bulletin issued by the Forecast Division, Weather Bureau, Washington, June 1, 1933]

When a tropical disturbance is in progress in the southern portion of the North Atlantic, the Gulf of Mexico, or the Caribbean Sea, ship reports of weather conditions by radio are frequently lacking from the areas in which the disturbance is located, even though some ships may be traversing the area. The present program provides weather reports twice daily throughout the hurricane season from a number of ships known to traverse the hurricane districts more or less regularly. This list of ships is now about as extensive as available appropriations will permit for daily service. Prefixed arrangements with other ships for securing additional or special observations when a storm is known to be in progress are not practicable; nevertheless, some additional observations are secured during such conditions by adding to weather bulletins broadcast for the benefit of ships a request for special reports from any ship within a specified area and by general notices included in navigation publications asking masters to radio weather reports on their own initiative, when a tropical disturbance is encountered or known to exist in the vicinity. Direct acknowledgment by letter is made to shipmasters who forward special observations.

During the coming hurricane season the arrangements described in the foregoing will be supplemented by publication of appeals in the Hydrographic Bulletin and other publications of the United States Hydrographic Office.

Notwithstanding the foregoing arrangements, it is known that in past instances, when reports were badly needed, ships, (principally those making occasional visits to ports in the hurricane area, and those not on regularly scheduled routes, with which it was impracticable to make prior arrangements for daily reports) were in the vicinity of a disturbance but sent no reports.

In order to assure the receipt of the maximum number of reports, a new and supplemental plan will be inaugurated at the beginning of the 1933 hurricane season. This additional program provides for direct calls for observations by radiogram to ships in certain zones in which a tropical storm is known or suspected to exist. Certain shore radio stations which are capable of communicating with vessels in the respective zones will be utilized as the medium through which the radiograms will be transmitted.

The Radiomarine Corporation of America has offered cooperation and will make its radio stations available. The locations, call signals, and ranges of the radio stations of that company, which will participate in the program, and the contacting weather stations, are as follows:

Radio station	Call signals	Range		Weather Bureau office
		Day	Night	
Palm Beach, Fla.	WOE	600	1,800	Miami.
Tampa, Fla.	WPD	400	1,000	Tampa.
Port Arthur, Tex.	WPA	600	1,600	Port Arthur.
Galveston, Tex.	WGV	300	900	Galveston.

For several years the South Puerto Rico Sugar Co., through its radio station at Ensenada (call letters WPR) has been cooperating with the Weather Bureau by sending general calls out to ships for weather reports when a hurricane had been reported or when there were indications of a tropical storm, and by relaying weather reports from ships which could not communicate directly with main land stations. This service has been of inestimable value to forecasters of the Weather Bureau at San Juan and Washington in the issuing of hurricane warnings and advices. The South Puerto Rico Sugar Co. will continue this cooperation and participate in the program by making direct calls for reports from ships in designated zones.

When reports are needed from any zone or from more than one zone, a message will be sent to the appropriate local Weather Bureau official, stating the zones and the times for which observations are desired. The official in charge of the Weather Bureau office will immediately advise the radio operator. The radio operator will then send messages direct to ships in the zone from which reports are desired, requesting that weather observations taken at specified hours be forwarded by radio to the Weather Bureau office at Washington.

As an added effort to provide the best possible service to the people, and to the business and shipping interests, it is planned to provide Weather Bureau officials in charge of stations on the South Atlantic and Gulf coasts with weather reports from ships whenever a hurricane is in progress and there is any probability of the sections in which the stations are located being affected by the storm. Such reports, in addition to the land station observations and the advisory and warning messages issued from Washington, will be helpful to local Weather Bureau officials in giving service.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Aimes, A.
Météoropathologie. Paris. 1932. 219 p. 23 cm.

Champly, René.
Les moteurs à vent; théorie, construction, montage, utilisation au puisage de l'eau et à la production de l'électricité. Paris. 1933. vii, 270 p.. illus. diagrs. 25½ cm.

Ekhart, E.
Ein interessanter Nebeleinbruch. p. 481–487. figs. pl. 26 cm. (Sonderdr.: Der Bergsteiger, Nr. 8, Mai 1933.)

Eredia, Filippo.
Le condizioni meteorologiche generali sulla aviolinea Milano-Roma. Roma. 1933. 19 p. figs. 25 cm. (Estr.: Rivista aeron., Anno 9, N. 1. Genn. 1933-XI.)
Disposizioni per i sondaggi notturni con palloni piloti. Roma. 1933. 8 p. figs. 24½ cm. (Estr.: Rivista aeronautica. Anno 8, N. 12. Dic. 1932-X.)
Lo scirocco in Italia. Roma. 1933. 22 p. figs. 32 cm. (Annali Uff. presagi. v. 5, 1932-XI.)

Johansson, Osc. V.
Die Beaufortskala in einfachen Formeln und Gedächtnisregeln. Helsingfors. 1933. 26 p. 24 cm. (Mitt. met. Inst. Univ. Helsingfors. N:0 23.)

Kadel, B. C.
Airport weather station. Do you know how to equip one for your port? p. 50–51. illus. 30 cm. (Airports. Washington, N.J. v. 4, Apr., 1930.)

Kidson, E.
Wairarapa floods of August, 1932. Wellington. 1933. p. 220–227. figs. 25½ cm. (Met'l office note no. 13.) (Extr.: New Zealand journ. sci. & tech., v. 14, no. 4, 1933.)

Kinoshita, M., & Uchiyama, K.
On the size of fog droplets. Tokyo. 1932. p. 144–147. figs. 26½ cm. (Sci. papers Inst. phys. & chem. res. no. 391. v. 19, 1932.)

Millas, José Carlos.
Memoria del huracán de Camagüey de 1932. Habana. 1933. 64 p. figs. 23½ cm.

National research council. Committee on hydrodynamics.
Report of the committee on hydrodynamics . . . Washington. 1932. 634 p. diagrs. 25 cm. (Bulletin Nat. research council. no. 84, Feb., 1932.)

Nunn, Roscoe.
Are you on chummy terms with the weather man? p. 5–6. 29 cm. (Southern florist. April 21, 1933.)

Sanson, Joseph.
L'Atmosphère et l'agriculture. Paris. 1932. 146 p. illus. maps. diagrs. 19 cm.

Schonland, Basil F. J.
Atmospheric electricity. London. [1932.] vii, 100 p. illus. diagrs. 17½ cm.

Theaman, John R.
Extreme weather records. [Indianapolis.] 1932. 44 p. 16 cm. (Extracts from gov't met'l pubs. Dec., 1932.)

Vanièr, Joseph F.
Dictionary of aeronautical terms in abridged form, German-English-French; French-English-German. New York. [c1929.] 141 p. 20½ cm.

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING MAY 1933

By IRVING F. HAND, Assistant in Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January 1932, REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged above normal for May at all three stations at which normal incident measurements are made.

Table 2 shows a deficiency in the total solar radiation received on a horizontal surface at Madison, Lincoln, La Jolla, Gainesville and Miami, and an excess at all other stations.

May was unusually cloudy throughout the United States and particularly so along the Atlantic Seaboard. Hence but few turbidity measurements were possible at Washington, and those obtained on May 18, the best day of the month, indicate that even then the sky was rather turbulent.